zooming and panning the map, and an "info" frame **5** which controls the display of overlay information on the map.

The overall information flow is indicated graphically in FIG. **3**. A map request to a map server computer **11** from the client computer **10** specifies the geographical coordinates of the map, which may be the bottom left corner of the map and the top right corner of the map or center point and scale, for example. The coordinates may be supplied to the map server **11** as the latitude and longitude in degrees of the center point of the map and its scale, for example.

The map is supplied by the map server **11** in a map response in any of the various conventional graphics formats, for example in "GIF" or "JPEG" format. In a preferred embodiment, the map server **11** will also return the coordinates covered by the map, but this is not essential as they may be inferred from the map request.

Also supplied by the map server **11** are the icons **6,7,8,9**, which are displayed within the "info" frame **5**. Icon **6** indicates banks, icon **7** restaurants, icon **8** hotels, etc. Information relating to each category of facilities (banks, restaurants, hotels, etc.) is held on an information server computer **12**. The information server computers **12** for the different information categories may be the same or different.

Clicking with the mouse on a respective icon **6–9** causes the client computer **10** to formulate an information request, which may be in the form of a standard Web URL (Uniform Resource Locator) including additional protocol elements relating to the location which the user wishes to search.

An important feature of the present invention is the addition of a universally recognised standard for geographic reference (i.e. longitude and latitude) to the protocols and standards of the Internet and the World Wide Web, and its use to combine data from mutually independent sources.

Information requests produced by the client computer **10** may be of various forms, provided that a protocol is provided for the exchange of the geographical coordinate data.

FIG. **3** shows the two key transaction types used by the client **10**. One transaction type consists of the information request, which goes to a provider of information to be overlaid on a map, such as an information server computer **12**, followed by a response from that provider **12**. The other transaction type is a map request, which goes to a map server computer **11**, followed by a map response back to the client **10**.

Both request types take the form of Uniform Resource Locators (URLs) which are transmitted in the same way as any other WWW request. Unlike other URLS, the map and information requests contain longitude and latitude information which specify the request's geographical coverage.

In a preferred embodiment, the responses also contain longitude and latitude information, but this is not essential as they may be inferred from the requests.

In a simple embodiment, the information response from the overlay or information server **12** consists of an HTML document. This document contains HTML tags specifying one or more overlay icons and their screen positions. It also specifies the map to be displayed underneath the icons.

In a more advanced embodiment, suitable for client browsers capable of running Java or some other local processing capability, the response from the information server **12** specifies one or more overlay icons and associates a longitude and latitude with each. Longitude and latitude are resolved to screen position by a Java Applet or other locally executed program.

The most important difference between the simple embodiment and the advanced embodiment mentioned above is the point at which the longitude and latitude of overlay icons are resolved to positions on the screen **1** of the client **10**. Advanced embodiments place this function within the client browser, where a Java Applet or some other local processing carries out the transformation. In simple embodiments, the transformation is carried out in the information server. Simpler embodiments are therefore less powerful and have less platform-independence, but can be implemented on simple client browsers.

The "map request" shown in FIG. **3** may take the following form:

  http://www.multimap.com?lon="−0.1666" &lat= "51.545"&scale="25000"&xp="500"&yp="300"

This map request contains parameters specifying the longitude, latitude and scale of the map, and also its dimensions in horizontal and vertical pixels (xp and yp).

An "information request" may be of the form:

  http://mcdonalds.com/locations.cgi?lat="51.5449" &lon= "−0.16658"&radius="1.6"

This is a search request to a server called mcdonalds.com requesting all locations within a one mile radius of a location in Hampstead, London.

The map requests and information requests may contain any number of elements from an expandable list of parameters, including the following examples:

  lat=51.5449 Latitude in degrees, as a single real number

  lon=−0.16658 Longitude in degrees, as a single real number

  radius=1.6 Radius in kilometres

  max=10 Maximum number of locations in search result

  xp=500 Horizontal size of the map in pixels

  lon=−0.16658 Longitude in degrees, as a single real number

  radius=1.6 Radius in kilometres

  max=10 Maximum number of locations in search result

  xp=500 Horizontal size of the map in pixels

  yp=300 Vertical size of the map in pixels

  scale=25000 Map scale

  vr=0 Virtual Reality level–0 for "reality", other values specify other "virtual worlds" for testing, simulation or whatever

There are a number of other possible terms that may be included.

In simpler embodiments, the map response is an image file encoded in either GIF or JPEG format, for example. It is sent in the same format as other image files on the Web. In more advanced embodiments, the map response may be take the form of either a raster image or vector data, and may be rendered at the client by a Java Applet or other local processing.

The information response can take one of a number of different forms, depending on the capabilities of the client browser.

In a preferred implementation, the information response takes the form of an HTML document which contains references to one or more overlay icons, each with an associated longitude and latitude, together with a call to a Java Applet or some other form of local processing.

In a simpler implementation, the HTML document may contain the screen positions of the icons as pixel offsets rather than longitude and latitude. In this case the positioning of overlay icons on maps is achieved through the